Krazy Golf

time limit per test: 2 seconds (2 seconds for Python)
memory limit per test: 1 gigabyte
input: standard input
output: standard output
points: 100 · problem code: golfroyale · author: glipR

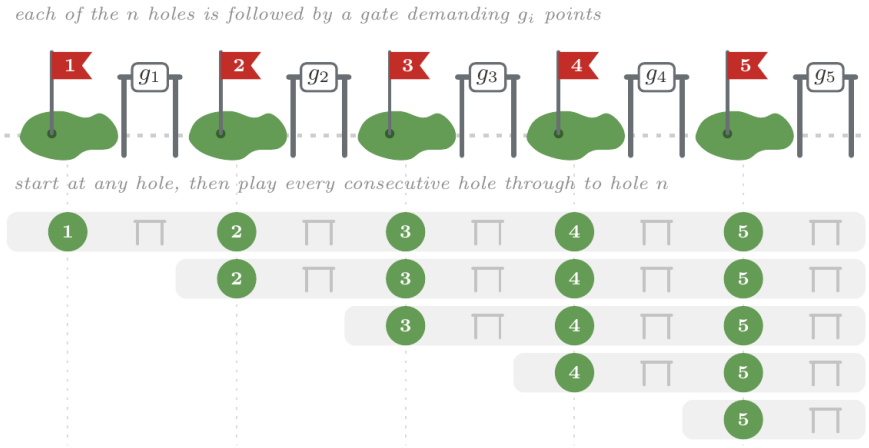
MAPS Team is keeping up with the kids, and wants to revitalise Golf, a historically slow and methodical sport, with the hyper-popular gaming trend of a battle royale!

The golf course is a standard n-hole course, however the scoring has been changed, because it makes way more sense for a higher score to mean a better golfer!

Each hole nets the player a certain amount of points, which accumulates throughout the course. However, at the end of every hole, there is a gate. If you do not have at least g_i points, then you are eliminated from the competition!

One of the competitors, Lauren, has given you their scorecard - how many points they would likely score in each of the n holes. She'd like to know how many holes she will get to play before being eliminated.

However, you don't always need to run the full n-hole course for the competition - you're allowed to start at *any* of the holes, as long as you complete each consecutive hole until hole n, or you are eliminated.



You'd like to know, for every possible starting hole - how many holes Lauren would be able to play before being eliminated.

Input

Input will begin with a single integer n ($1 \leq n \leq 3 \times 10^5$) - the number of holes in the course.

2 lines will follow, each containing n integers.

The first line specifies the gate values g_i ($0 \leq g_i \leq 10^9$) - If, after completing hole i, you do not have g_i points, you are eliminated from the competition!

The second specifies the point values p_i ($0 \leq p_i \leq 10^9$) - How many points Lauren can expect to receive from hole i.

Output

Output n integers - representing how many holes Lauren would be able to play if starting at hole 1, 2, 3, ... n.

Example 1

Input

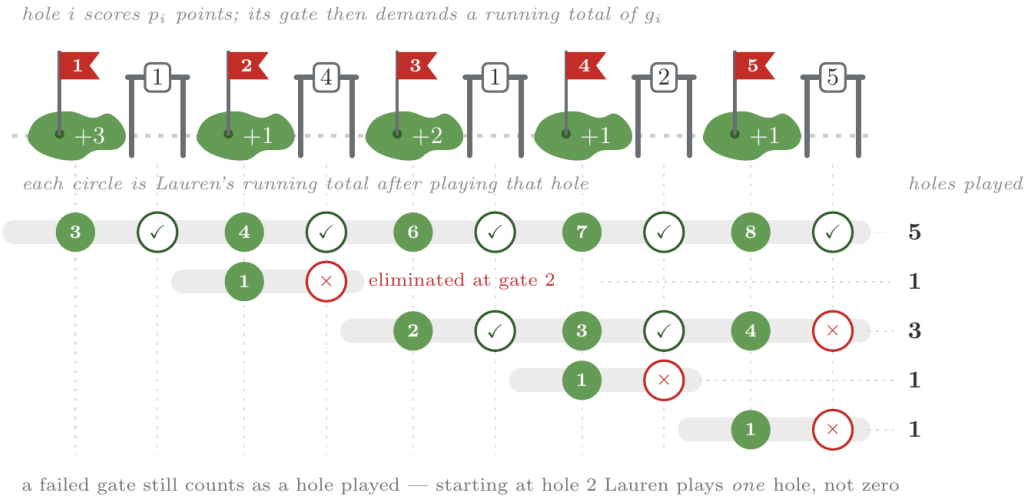
```
5
1 4 1 2 5
3 1 2 1 1
```

Output

```
5 1 3 1 1
```

Explanation

The reasoning for the sample output is provided below:



a failed gate still counts as a hole played — starting at hole 2 Lauren plays *one* hole, not zero